

Letter from the Editors

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We are happy to publish this special issue dedicated to Prof Rosangela Marchelli. This issue not only celebrates her long-standing scientific activity on occasion of her significant anniversary, but it is meant to recognize her contribution to bioorganic chemistry in the field of artificial DNA, and in particular of peptide nucleic acids.

Rosangela started her scientific career as a student at the University of Pavia, in Italy, in the field of heterocyclic chemistry, moved to the National Research Council of Canada at Halifax, N.S. as a Post-doc with Professor R.A. Heacock. Coming back to Italy, she worked with Prof Giuseppe Casnati, who scouted her as a very brilliant researcher to start new scientific activities in the field of natural substances and molecular recognition at the University of Parma, contributing to create a now well-established team of researchers in the field of organic chemistry. Her work rapidly led to success in the recognition of metal ions and organic molecules, and in particular in the difficult task of chiral recognition. As a visiting Professor at the Weizmann Institute in Israel she achieved the separation of enantiomers of amino acids by chromatographic methods, in collaboration with Professor E. Gil-Av, who pioneered this field of research. Chirality has since then been one of the subjects where she has reached results of broad applicability and mechanistic insights into the recognition processes, in particular of biologically relevant molecules. Pushing further in this interesting field, she had the ability to foresee its possible implications in the field of bioorganic chemistry of nucleic acid analogs, and encouraged us to start new researches in the synthesis and in the study of biological properties of chiral peptide nucleic acids. New insights in the DNA binding processes and in models for designing PNA structures have

been derived from these works. The tools developed in the recognition of enantiomers were crucial for this type of studies, allowing to assess optical purity and racemization processes, so far overlooked. The collaboration with Nielsen's group in Copenhagen has been very important in the developments of this research field, which has created an enthusiastic group of scientists in our lab.

At the same time, Rosangela has cultivated the interest of making Science available to the Society and has devoted part of her research to the application of chemistry to biotechnology and to food science. The experience in these subjects has stimulated her toward the application of PNA in several fields, in particular in the use of PNA as components for devices dedicated to diagnostics for food and biomedical applications.

Food safety is another subject which she stimulated in her group, with particular regards to mycotoxins and food allergens. Rosangela Marchelli has been the Dean of the Faculty of Agriculture of the University of Parma (which she contributed to create) for 15 years; she is presently member of a panel of experts of the European Food Safety Authority (EFSA).

She has been awarded the Research Prize from the Division of Organic Chemistry of the Italian Chemical Society; she has chaired a number of conferences in the field of chemistry and food sciences, and has been invited speaker in many symposia around the world. She has been the coordinator of many research projects, in particular in the field of PNA, through which she contributed to establish the importance of these molecules among Italian scientists.

It has been a pleasure to see how scientists have gladly responded to our invitation. We have chosen, for this issue, to include some of the subjects which are

(and we are sure will be in the next years) particularly in line with her interests.

Thus, we have collected a series of paper of scientists honoring her with their works ranging from organic synthesis to biomedical applications of PNA.

PNA as tools for molecular biology and biotechnology is the subject of Komiyama's paper, reporting the synthesis of ligand-modified PNAs which bind cerium ions promoting site-selective DNA hydrolysis, an application which might be of interest in fields ranging from *in vivo* repair of DNA to anticancer drugs.

Application of PNA to modulation of gene expression in cellular systems is reported in the work of Romanelli and Saviano using PNA to interfere with microRNA pathway, and in that by Gambari, in which a decoy strategy by PNA-DNA chimeras was used.

Conjugation of PNA chemistry and advanced sensory systems can produce very potent analytical tools. The development of diagnostic platforms using PNA and surface plasmon resonance (SPR) techniques is reviewed in the paper by Spoto. In Licandro's paper, sensitive and specific DNA detection using a modified PNA as recognition moiety for an amperometric sensor is presented.

Totsingan and Green's paper is an example of how PNA can be used not only as DNA-binding molecules, but also as interesting "smart materials" with molecularly controlled properties, dealing with the possibility to achieve helix handedness, which has been shown to be of great importance in polymer science.

Last, but not least, we have included two papers by our research group, led by Rosangela, one in the field of synthetic methods applied to PNA (Manicardi) and one on the application of PNA technology to difficult tasks in the field of food analysis, such as olive oil authenticity

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Submitted: 06/08/12; Accepted: 06/08/12
<http://dx.doi.org/10.4161/adna.21100>

(Corradini), two of the most relevant subjects developed by her in the last years.

Two more invited papers dedicated to Rosangela are scheduled to be published in the next issue of this journal, by qualified scientist such as by Bonifazi (a previous student of Rosangela's Organic Chemistry course) and by Peter Nielsen.

We wish to thank all authors who contributed to make this issue particularly interesting, we are sure that their efforts have been made keeping in mind the competence, the scientific soundness and most importantly, the human warmth and friendship of Rosangela Marchelli. We hope that the readers will enjoy reading it.